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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,152	01/23/2002	John Michael Miller	200-0459	8695

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FORD GLOBAL TECHNOLOGIES, INC
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EXAMINER

BENENSON, BORIS

ART UNIT PAPER NUMBER

2836

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/053,152

Applicant(s)

MILLER, JOHN MICHAEL

Examiner

Boris Benenson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 34-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 34-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

1. The substitute specification, submitted by the Applicant on 12/2/2002 is entered. Objections to the Specification are overcome.
2. Objections to the Abstract are overcome.
3. The amendments to Claims, submitted by the Applicant on 12/2/2002 are entered. Claims 22-33 are canceled and Claims 34-49 are entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 34-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Diehl et al. (5,765,513) in view of Ule (3,896,346). Diehl et al. discloses an electromechanically actuated valve (12) for use as an intake or exhaust valve in an internal combustion engine (Abstract, lines 1-2). Diehl doesn't disclose a method for utilizing the energy accumulated in during slowing a valve down read on decelerating by transferring it to a valve being accelerated. Ule teach a high speed electromagnet

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control circuit where both actuation and de-actuation speed of the electromagnet are increased and rapid de-actuation is achieved either by a high reverse voltage applied to the solenoid and the return of its energy to the power source or by a diode and capacitor network which transfers the magnetic energy to a second solenoid which thereupon becomes energized (Abstract Lines 11-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified electromechanically activated valve disclosed by Diehl et al. with teachings of Ule, because it will enable valves to open and close at faster rate and save energy.

Claims 34-47 describe substantially similar methods.

Limitations as

- a) "Transferring electrical energy generated ...",
 - b) "Recirculating a current generated ...",
 - c) " Reversing a flow of current... and directing said current."
 - d) " Generating a current in first electromechanical cylinder exhaust valve... and routing said current to second electromechanical cylinder intake valve..."
- are not distinguishable in the application. The steps of transferring energy generated during closing exhaust valve of one cylinder to different cylinder to open its intake valve and transferring energy generated during closing intake valve of one

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cylinder to different cylinder to open its exhaust valve are similar in their nature and defined by timing diagram of the engine controller, which is inherent in the method.

Referring to Claim 47, in a method for controlling an engine described in the Claim particular mechanical design of the valve is non-essential and ball-screw design of the valve should have no effect on patentability of the method.

5. Claim 48 rejected under 35 U.S.C. 103(a) as being unpatentable over Diehl et al. (5,765,513) in view of Reinicke (5,318,064) and further view of Ueda et al. (5,150,020).

Diehl et al. discloses an electromechanically activated valve for use as intake or exhaust valve on internal combustive engine (col.2, line 58). Reinicke teaches a motor-operated valve, which "employs a motor-driven ball-screw system to develop requisite axial displacement for the valve member" (Col.1, Lines 19-21). In such design "Great mechanical advantage is achieved for relatively low motor-torque delivery" (Abstract). Neither Diehl et al. or Reinicke disclose a method of an electrical control system, including plurality of the motors. Ueda et al. teach a Driving Controlling Method for Drums of Automatic Winder. That automatic winder includes a plurality of accelerating and decelerating motors and inverters to control such motors. The method effectively controls the motors by redirecting

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"regenerating energy, generated upon deceleration to be consumed by the motors being accelerated" (Col.3, Lines 42-45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the electromechanical valve of Diehl et al. to use a motor to drive the valve as taught by Reinicke because this allows control an engine by controlling the valve's position, valve's dwell time duration, valve's opening and closing rate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of controlling the electromechanical valve of Diehl et al. and Reinicke to use recaptured potential energy from one valve to drive another valve as taught by Ueda et al. because this allows regenerated energy to be utilized which saves energy.

Referring to Claim 49, Reinicke teaches an electromechanical valve with ball-screw design.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Boris Benenson whose telephone number is (703) 305-6917. The examiner can normally be reached on M-F (8:20-6:00) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (703) 308-3119. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Boris Benenson
Examiner
Art Unit 2836

B.B
February 11, 2003

A handwritten signature in black ink, appearing to read 'B. Sircus', with a long horizontal flourish extending to the right.

**BRIAN SIRCUS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800**